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### **ABSTRACT OF THE INVENTION**

1           A manufacturing method of metal substrate catalytic converter and the resulting  
2 product. In this method, a multiple layer aluminum and ferritic stainless steel composite  
3 material is first made by roll-bonding and then further processed to a final foil thickness.  
4 The composite foils are then fabricated to a honeycomb-like converter with air flow  
5 channels. The converter is then thermally treated at a high temperature during a necessary  
6 converter fabrication process. The monolithic FeCrAl alloy is then obtained in the converter  
7 by in-situ diffusion alloying with pre-oxide film on the surfaces. The resulted material has  
8 improved oxidation resistance and thermal dimension stability at a high temperature.